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National Institutes of Health

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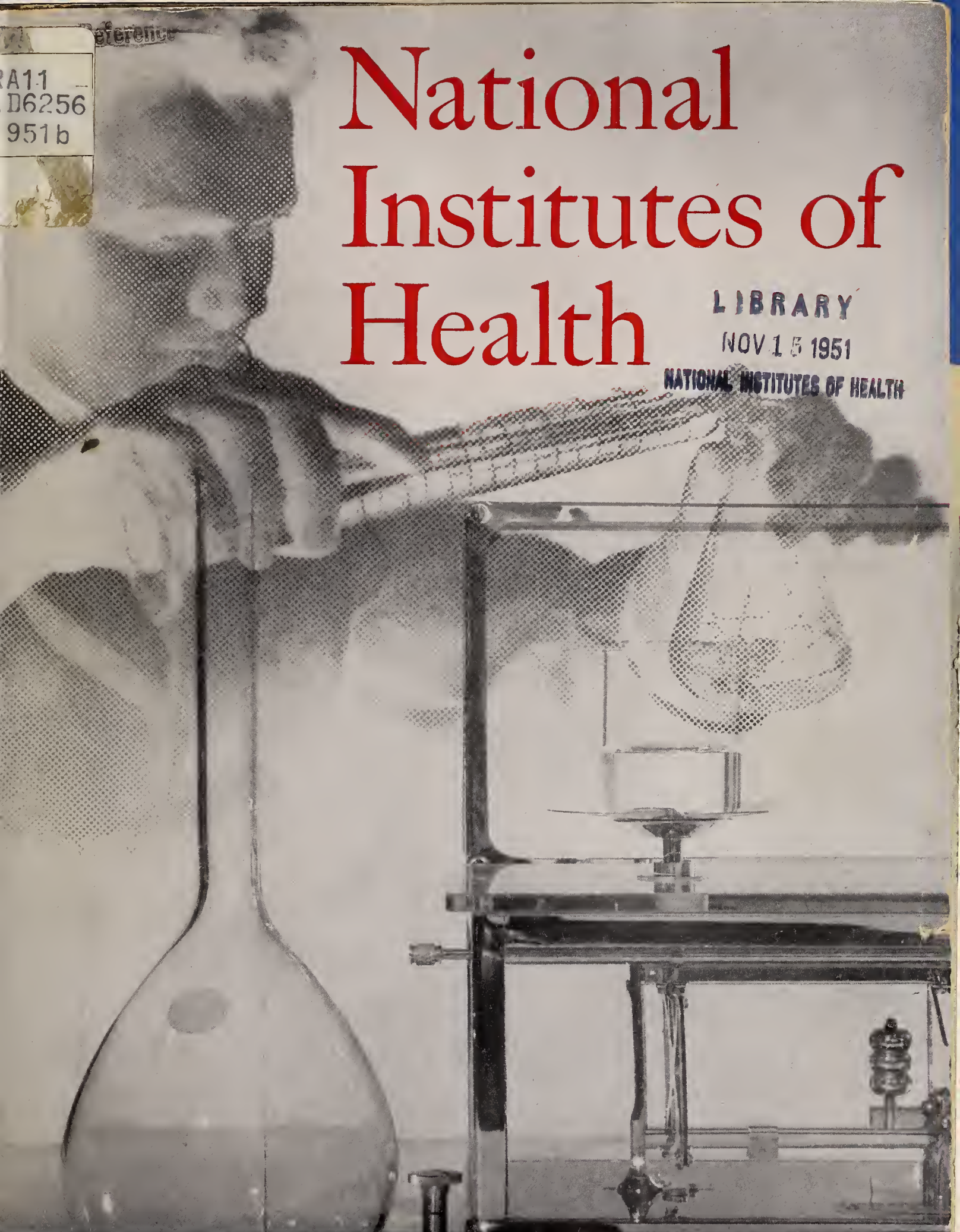

FEDERAL SECURITY AGENCY · Public Health Service

Through the last decade this Nation has become increasingly aware of the benefits to be derived from basic research in the medical sciences. Recent discoveries of new drugs and advances in the treatment and control of disease have focused attention on the possibilities for better health that may be realized through expansion of our scientific research activities. The National Institutes of Health of the Public Health Service plays an important role both in the study of those major diseases which kill or disable man and in the support of similar research at other scientific centers. The Institutes and the new Clinical Center will provide needed opportunity for a unified approach to clinical and basic research.

Oscar R. Ewing

Federal Security Administrator

Federal Security Agency

PUBLIC HEALTH SERVICE

NATIONAL INSTITUTES OF HEALTH

PUBLIC HEALTH SERVICE PUBLICATION NO. 81

As the National Institutes of Health will appear in 1953.

1798 President John Adams signs the bill establishing hospitals for merchant seamen—the Marine Hospitals.

1887 Dr. Joseph J. Kinyoun founds a research laboratory at the Marine Hospital, Stapleton, Staten Island, N. Y.

1891 The Hygienic Laboratory is moved to the Washington headquarters of the Marine Hospital Service.

1912 The act is signed changing the name of the Public Health and Marine-Hospital Service to the Public Health Service.

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1930 The Hygienic Laboratory is renamed the National Institute of Health.

1937 The National Cancer Institute is established by Congress.

1938 The National Institute of Health moves to new location in Bethesda, Md.

1939 The Public Health Service is transferred from the Treasury Department to become an operating unit of the Federal Security Agency.

1947 Division of Research Grants is officially established to administer Federal grants in support of research.

1948 National Heart Institute is authorized by Congress; three other institutes—Microbiological Institute, Experimental Biology and Medicine Institute, and National Institute of Dental Research—are established by regrouping existing laboratory units, thus fixing the pattern of reorganization into separate institutes, and NIH becomes the National *Institutes* of Health.

1949 Activities of the Mental Hygiene Division, Bureau of Medical Services, Public Health Service, are transferred to NIH to become the National Institute of Mental Health.

1950 The National Institute of Neurological Diseases and Blindness and the National Institute of Arthritis and Metabolic Diseases are officially established, the latter assuming the program and activities of the abolished Experimental Biology and Medicine Institute.

Dr. Joseph J. Kinyoun, Director of the Hygienic Laboratory from 1887 to 1899

History

Ever since the Marine Hospital Service was established in 1798 to provide medical care for merchant seamen, a steadily increasing share of responsibility for the Nation's health has been shouldered by the Public Health Service of the Federal Security Agency. Besides its 23 hospitals, it maintains the Nation's only leprosarium and the only hospital in the world devoted solely to the care of drug addicts. The Public Health Service works closely with the various State departments of health in the improvement and extension of general community health services. It contributes to the control of venereal disease, tuberculosis, heart disease, cancer, diabetes, and mental illness. It gives special attention to the problems of industrial hygiene and stream pollution. It furnishes medical care to officers and enlisted men of the U. S. Coast Guard. The Service participates in world health activities, operating health projects in foreign countries and collaborating in the development of their health programs. Care of Eskimos in Alaska and of Indians living on Federal reservations, malaria control among the coolies building the Burma Road during World War II, quarantine control of migrant laborers from Mexico and the Bahamas—these represent the diversity of Service programs in the United States, in its territories, and in foreign lands.

The Public Health Service also maintains one of the largest medical research centers in the United States—the National Institutes of Health, at Bethesda, Md. Here, scientists study almost every major disease entity, as well as that fundamental question in both health and disease—how does the body function?

Much of the growth of the National Institutes of Health has come in the past decade. Its scientific tradition, however, runs back to 1887, when a medical officer of the Public Health Service, Dr. Joseph J. Kinyoun, set up a one-room laboratory in the Marine Hospital at Stapleton, Staten Island. Kinyoun, who

had studied with Koch and Pasteur, was the first to demonstrate the cholera organism among immigrants arriving in the port of New York.

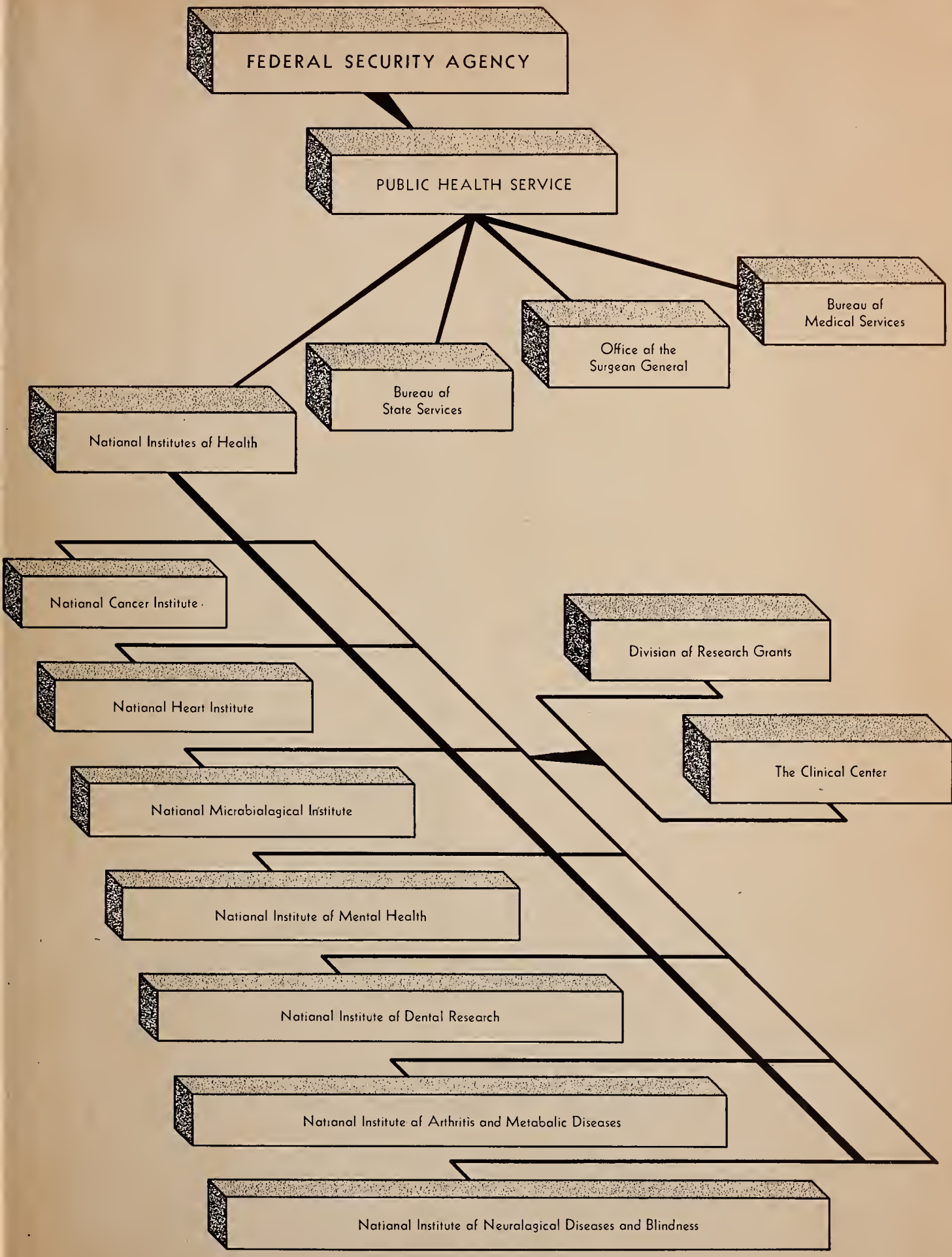
Since Kinyoun's day, the National Institutes of Health (first known as the Hygienic Laboratory) has made many contributions to improved control of infectious and nutritional diseases, contributions which have helped to add 19 years to the average life span of the American citizen since 1900.

Some of the accomplishments by National Institutes of Health scientists include: pioneer work on anaphylaxis by Rosenau and Anderson in 1906; the recognition by Goldberger in 1914 that pellagra is a dietary deficiency disease; Francis' discovery in 1919 that a disease called deerfly fever in Utah was, in fact, tularemia, an infection conveyed to humans from diseased jack rabbits; the development of a vaccine for Rocky Mountain spotted fever in 1924; the discovery of new diseases of man such as lymphocytic choriomeningitis, rickettsialpox, and Louisiana pneumonitis; and proof that fluoridated public water supplies can prevent tooth decay in children.

The conquest of communicable disease is by no means completed. National Institutes of Health scientists are working on such diseases as poliomyelitis, influenza, the common cold, and a wide variety of tropical diseases. In recent years, however, the scope of the research program has expanded to include so-called long-term diseases—cancer, arthritis, cardiovascular disease, mental disorders, blindness, and the neurological diseases such as cerebral palsy, multiple sclerosis, and epilepsy.

These are problems confronting the practicing physician and the research scientist everywhere, and here at the National Institutes of Health, as elsewhere, there are various modes of attack. Scientists are seeking new drugs and new techniques of treatment and diagnosis. They are searching for the causes of disease and the ways in which diseases act upon the body. Finally, because disease frequently involves not one but many of the body's processes, they are undertaking much basic research simply to learn more about the human organism and its chemical and biological mechanisms.

Throughout the history of medical research, long delays have occurred before laboratory and clinical findings could be evaluated and made available for general use. To help overcome this delay, the Public Health Service has designed a Clinical Center. With its specialized physical facilities and the opportunities it presents to combine clinical and laboratory research, the Clinical Center should speed the solution of many of today's most baffling problems in the long-term illnesses.


FEDERAL SECURITY AGENCY
PUBLIC HEALTH SERVICE
Bureau of Medical Services
Office of the Surgeon General
Bureau of State Services
National Institutes of Health
National Cancer Institute
Division of Research Grants
National Heart Institute
The Clinical Center
National Microbiological Institute
National Institute of Mental Health
National Institute of Dental Research
National Institute of Arthritis and Metabolic Diseases
National Institute of Neurological Diseases and Blindness

National Microbiological Institute

Although the National Microbiological Institute was not established officially under this name until 1948, its program of research on the infectious diseases reaches back to the very beginning of the National Institutes of Health.

It has also produced many of the scientific achievements for which NIH is noted—among these are: the development of vaccines for typhus, mumps, and Rocky Mountain spotted fever; a successful treatment for whooping cough; elimination of the paralytic factor from rabies vaccine; and the discovery that the rat flea is the vector of endemic typhus.

Though popular interest in medical research has shifted to the chronic diseases, many acute illnesses caused by microorganisms still harass man. Poliomyelitis, influenza, tuberculosis, the common cold, diarrheal and rickettsial diseases—these are some of the diseases which scientists of the Laboratory of Infectious Diseases (one of the four Microbiological Institute laboratories) are now studying.

How can the several strains of poliomyelitis be grown in experimental animals so that the disease may be studied more effectively? What nutritional factors govern susceptibility to amebiasis? How can a vaccine effective against the two main groups of influenza virus be developed? And, from a more fundamental point of view, what is the relationship of viruses to host-cell metabolism and the mechanisms of virus multiplication? Scientists of the National Microbiological Institute are trying to answer such questions.

Central to almost every problem of the Laboratory of Infectious Diseases, as it is to virtually every laboratory working in this field, is the question of immunity.

In the Laboratory of Tropical Diseases, much work centers on those diseases affecting hundreds of millions of people in tropical countries—malaria, schistosomiasis, onchocerciasis, filariasis, and trypanosomiasis. These are problems which also concern the people of this country deeply. Damage done the tropical economies affects the state of business and industry in the United States. The United States must also be ready for any contingency which may call upon its citizens or soldiers to operate in tropical areas. Finally, there is always the possibility that certain tropical diseases may invade this Nation.

More effective protection against tropical diseases involves investigation into such problems as diagnostic procedures for parasitic diseases; the development of immunologic tests; fundamental research into the cytology, metabolic activities, and enzyme systems of parasites and parasite vectors; the development of new drugs, new methods of treatment, and studies on how drugs act against disease.

Measuring stream flow-rate, Puerto Rico, in tests of chemicals for killing snails which transmit schistosomiasis.

Beyond the investigation of factors which will permit successful control of the tropical diseases, the Laboratory of Tropical Diseases must consider the educational and economic levels of impoverished countries where control methods must be simple, inexpensive,

and acceptable to the peoples affected. To develop techniques which meet both these as well as general medical needs, the Microbiological Institute maintains field installations in several areas of the United States, in the Pacific Islands, in Central and South America, and in tropical Africa.

In the field, the basic researcher becomes the clinical investigator. More than any other group at NIH, perhaps, Microbiological Institute scientists have been called on personally to fight actual disease epidemics. In 1946, for example, when a mysterious illness broke out on Long Island, staff members of the Laboratory of Infectious Diseases were asked to investigate by the New York State Department of Health. They discovered that the illness was a previously unidentified disease, named it rickettsialpox, found the animal reservoir, and identified a mite as the transmitting agent. Again, in 1937, it was a Microbiological Institute scientist who found that a particular species of tick harbored the rickettsial germs which caused 9-mile fever—a disease later found to be identical with Q fever. In 1947, scientists of the Microbiological Institute discovered that Q fever could be contracted through drinking raw milk or breathing the air of barns housing infected cattle.

At Hamilton, Mont., where the National Institutes of Health maintains its largest permanent field station—the Rocky Mountain Laboratory—scientists specialize in the study of arthropod-borne diseases. Scientists there are working on the natural history of disease in animals and birds, securing data on medical entomology, and maintaining a close watch on the spread of these diseases among humans.

Should biological warfare ever become a reality, the Microbiological Institute would be an important source of knowledge and manpower to back the Nation's defense. In preparation for such an eventuality, these scientists have already taken preliminary steps to define what organisms might be used in biological warfare, how they might be disseminated, and what protective measures are necessary.

Not the least of this Institute's functions is its role as monitor of the Nation's biological products. No vaccine, toxin, or antitoxin manufactured by a licensed pharmaceutical house reaches the corner drug store or is exported out of the country unless it meets the Federal Government's rigid requirements for the safety, purity, and potency of these products. These requirements are prescribed in regulations made jointly by the Surgeons General of the Public Health Service, the Army, and the Navy. The Laboratory of Biologics Control enforces these regulations. Its officers regularly inspect manufacturing laboratories and plants in this country and abroad which produce blood derivatives, chemotherapeutic serums, antitoxins, and similar biological products used in this country for the prevention or treatment of diseases or injuries of man.

The Laboratory of Biologics Control has also developed some of these products. Present work, for example, designed to speed production and to insure the purity of blood plasma, shows promise that future plasma transfusion will be safe from the dangers of hepatitis infection and other impurities, and that plasma can be sterilized much more rapidly and effectually than has hitherto been possible.

Rocky Mountain Laboratory, Hamilton, Mont.

National Institute of Arthritis and Metabolic Diseases

When the National Institute of Arthritis and Metabolic Diseases was established in 1950, the Experimental Biology and Medicine Institute was abolished and its activities transferred to the new Institute.

The National Institute of Arthritis and Metabolic Diseases thus inherits the record of achievements made by its predecessor—such findings as the cause and cure of pellagra and ariboflavinosis, the discovery that ordinary saline solution holds great promise as an effective emergency treatment for shock, the development of synthetic drugs as effective as morphine and codeine in the relief of pain.

Though NIAMD has made noteworthy contributions to the treatment of specific abnormal conditions in man, it is largely for their basic research that the laboratories of this organization are known. The laboratory in which studies of sugar chemistry are in progress, for example, has been a focal point for such investigations for over two decades. Laboratory of Physical Biology scientists have shared materially in the development of electron microscopy as a tool for observing microorganisms never seen before, for determining the methods by which viruses multiply and develop, and for studying the ultramicroscopic structure of cells and organisms.

From these and other studies—such as the relationship between cellular metabolism and enzymic catalysis, the biochemistry of muscle contraction, and the metabolism of fats, proteins, and carbohydrates—come our slow documentation of how the whole man functions and thereby how he grows ill, grows old, and dies.

The purpose of this basic research is to extend our knowledge about particular diseases and also about

Lucite container used as a shield in handling a low-level radioactive isotope.

Substance magnified 8,000 times through the electron microscope.

general life processes. Either line of action can yield practical contributions to medicine and public health. NIAMD's chemists, for example, are working on the synthesis of cortisone and other steroids for the treatment of arthritis and rheumatic fever. However, basic research on the general role of the endocrine glands may also throw light on treatment of these diseases and many others, and on the means of preventing their occurrence. This balanced approach characterizes the Institute's research program—the application of a wide diversity of disciplines directly to the study of the stubborn metabolic diseases and less directly to the general life processes responsible for both disease and health.

Both methods are amply illustrated by NIAMD's Laboratory of Biochemistry and Nutrition, another of the four major laboratories which encompass NIAMD's research program. The "practical attack" made by its nutritionists involves such studies as the effect of vitamin deficiencies on peptic ulcer; the effect of vitamins on degenerative diseases of the liver, especially cirrhosis of the liver; the relationship of various nutritional elements to the growth of gray hair in animals. On a more fundamental level, nutritionists are studying the influence of hormones in governing the disposition of food in the body and are trying to determine substances which are necessary for the production and proper function of red and white blood cells.

Like all the Institutes, NIAMD is helping prepare for the Nation's defense. The development of synthetic pain-relieving drugs, for instance, has made the United States potentially independent of the Orient for the importation of opium and its principal derivatives, morphine and codeine. NIAMD radiation researchers have provided practical counsel to the Government concerning safety procedures against the dangers of atomic radiation; and in the laboratory these scientists are weighing the value of a variety of materials for treating the effects of radiation on both animals and man.

Further studies are going forward on the effectiveness of emergency use of saline solutions as a plasma substitute in cases of shock due to burn, part of a larger investigation into the whole field of plasma and blood substitutes for treatment of burn, injury, and hemorrhage—all problems of importance in peacetime which would become of enormous significance in the event of large-scale bombing attacks on our cities.

Pipetting a radioactive solution by remote control in the Isotope Laboratory.

National Cancer Institute

The structure and reproduction of cells, the chemical activity of cellular components, the role of endocrine glands and their secretions, the reaction of cells to viruses, the effects of radiation on cells—these are examples of the investigations now under way in the National Cancer Institute.

These are cancer problems, but they are also general problems in basic science as well—problems that concern the biologist, pathologist, endocrinologist, biochemist, physiologist, biophysicist, virologist, and cytologist. Since answers are elusive in the search for cancer "causes," and the development of cancer "cures" is difficult, the study of this disease must be pressed at every point where a clue is indicated. Certain viruses create specific tumors in animals; some cancers are accompanied by certain endocrine disturbances, and a few cancers in certain animals display hereditary characteristics. The possibilities for finding the cause and more effective treatment of cancer, therefore, depend on examining these and a wide variety of other questions about the basic processes of life.

The study of cancer is also direct. Scientists of the National Cancer Institute are engaged in the synthesis and testing of chemicals and compounds which might destroy malignant tissue. At the same time they are searching for chemicals or compounds which might be responsible for the abnormal cell growth that we call cancer. Further, they are working on the development of methods by which cancer can be more quickly and surely diagnosed.

Surgical insertion on back of mouse of transparent plastic chamber through which tumor growth will be studied.

These problems are far from simple. They involve such preliminary questions as: how to induce specific cancers in animals; how to observe the progress of cancer; how to isolate cancer cells from normal tissue. The solution to these problems, largely matters of laboratory technique, will determine to a great extent the next searching moves more directly related to cancer in the human being.

Since its establishment in 1937, the National Cancer Institute has made important contributions toward an understanding of the cancer enigma in its various aspects. The Institute's investigators have screened, from more than 3,000 compounds, some 50 chemicals which have destructive effects on tumors in mice and in a few instances have shown limited success on humans with certain types of advanced cancer. Institute investigators were responsible for first producing experimental gastrointestinal cancer in animals, and for first transforming normal mammalian cells into cancer cells that would invade and kill animals of the same genetic strain as those from which the cells originally came.

Investigators in the Cancer Institute have cultured large masses of living tissue from a single cell, assuring scientists of an entire culture of uniform type and enabling them to study cell behavior without the confusing presence of normal or foreign cells. Through chromatography, Cancer Institute scientists have further developed a new method of purifying and isolating viruses and other cell particles.

Though developments in the treatment of cancer have been slow, progress has been such that where early diagnosis can be made, either surgical or radiation treatment, or a combination of these, frequently can be effective. Advanced and inoperable cases have also benefited from hormone treatments and chemotherapy.

To help reduce cancer mortality, the National Cancer Institute maintains a control program whose double purpose is to create public and professional awareness of present cancer knowledge and to improve cancer services for diagnosis and treatment. This program has done much to lead the cancer patient to the clinic early and to provide him with good medical attention when he gets there.

The control program falls into six general categories: grants to States to help support their cancer control activities; NCI studies of tests; grants to institutions and individuals for special studies, such as the evaluation and development of cancer diagnostic tests; grants to medical schools and other professional schools and institutions to improve or initiate special cancer instruction programs; traineeships to physicians for advanced study; and an educational and informational program for the medical profession and the general public through such media as films, manuals, and exhibits.

When ultimately simple and easy diagnostic tests are developed for mass use, when better treatments or cures for cancer are found, such a program as this will become even more essential. Just as tuberculosis, when diagnosed early, can be treated successfully in the great majority of cases, so cancer will be treated more effectively when the means for early diagnosis are available.

Medical students receive practical training in cancer diagnosis at a clinic under National Cancer Institute's grants program.

National Institute of Dental Research

Dental research began at the National Institute of Health in 1931; that same year, it was observed in certain areas that the natural occurrence of fluorine in drinking water was responsible for the mottled enamel of teeth. Seven years later, a Public Health Service dental research worker discovered that this same fluorine might also provide partial protection against tooth decay. Thus began a painstaking course of basic epidemiologic and laboratory investigation which is now leading to public adoption of artificial fluoridation of water supply systems in many cities for the partial control of dental caries in children.

The series of achievements which has led to adoption of these practical measures in over 70 cities in 20 States (at the present writing) is for the most part due to the experimental work of scientists of the National Institute of Dental Research. The problems have been many. At what fluorine concentration would a maximum protection against decay be provided and at the same time guard against fluorosis or mottled enamel? The answer: one part fluorine to a million parts of water. What harmful side effects might fluorine in this concentration have on the body? The answer: none. To what degree does fluorine actually halt the process of tooth decay?

All the answers to this last question are not yet in. An extensive study is being conducted by the Public Health Service at Grand Rapids, Mich. Now nearing the halfway mark of a 10- to 15-year trial, it has been found that among older children, whose teeth were already formed when the water fluoridation began, tooth decay has been reduced by 20 to 25 percent; while in younger children, whose teeth were formed after fluoridation had begun, there was a 60-percent reduction of caries.

Whether artificial fluoridation also protects adults against tooth decay awaits the trial of time. Dental investigators have, however, thoroughly examined one area where natural fluoridation occurs and have found that life-long inhabitants have incurred considerably less tooth decay than adults elsewhere.

In the control of tooth decay, fluoridation is only a partial answer. The final answer must come through better understanding of the normal structure of teeth and all the various factors which may determine tooth pathology. It is this principle which governs a wide variety of investigations in dental bacteriology, histology, biochemistry, and biophysics.

Dental researchers, therefore, are exploring the organic framework of enamel and dentine with the electron microscope; studying the organic components of saliva, and the reaction of teeth to various chemical agents. They are studying and classifying the lactobacilli (the acid-forming bacteria of the mouth) and investigating the relation of oral bacterial metabolism to dental caries. This last study has already shown interesting results, especially the finding that certain fatty acids may have an inhibitory effect on caries process.

Tooth enamel magnified 4,000 times by electron microscope.

While dental research workers have begun the investigation of the periodontal or degenerative dental diseases, such as gingivitis and pyorrhea, a full-scale program has been hampered by several factors, particularly the slow expansion of dental research itself and the dearth of trained dental investigators. In its planning for the near future, both through grants-in-aid and through research in its own laboratories, the Dental Research Institute will provide for intensified research in the relatively unexplored but highly important field of periodontology.

Biological and food samples reduced to ash prior to fluorine analysis.

Assaying dietary materials for their effects on oral microorganisms.

Recording results of annual dental examinations during the course of investigations on water fluoridation at Grand Rapids, Mich.

National Institute of Mental Health

To the man, woman, or child who suffers from psychological or emotional disorders—the man who can't keep a job, the woman who suffers from imaginery illnesses, the "bad" boy who constantly plays hookey—local mental health programs frequently provide invaluable aid.

Through guidance given by its psychiatrists, psychologists, nurses, and social workers, through lectures, and through close contact with teachers and parents, community programs are often able to help individuals with emotional problems and perhaps reduce the number of serious cases of mental illness which now fill half the hospital beds in America.

To help expand these programs where they already exist and to help initiate them where not yet established (almost half the States did not have them in 1946), the National Institute of Mental Health grants funds to the States and provides them with consultation services. Since there is a serious shortage of highly trained specialists—psychiatrists, clinical psychologists, psychiatric social workers, and nurses—the Mental Health Institute also makes grants to non-Federal institutions for expanding their training programs in these specialties and to promising students to assist them in continuing their studies.

Control of almost any disease depends on several factors. Important among these is specific scientific knowledge concerning causes, diagnosis, and treatment; and public knowledge that preventive measures and treatment are necessary and available.

The latter presents special difficulties with respect to mental disease. Because many people regard mental illness with fear, shame, and a sense of guilt, and because many people do not know that positive

A child is examined by a psychiatrist at the Prince Georges County Mental Health Clinic.

A barbiturate addict under treatment at the United States Public Health Service Hospital, Lexington, Ky.

steps can be taken to promote good mental health, many do not seek treatment until the illness has made considerable progress.

It is for this reason that the professional staff of the Institute's Mental Health Center at Phoenix, Ariz., is trying to assess the mental health status of a typical community, to study the factors contributing to mental health problems, and to gain an understanding of how people feel about these problems and how they should be met.

By maintaining an extensive information program through films, publications, and other media, the Mental Health Institute attempts to acquaint the public with such facts as are already known concerning the causes and control of emotional and mental disturbances.

In order to extend this knowledge far beyond its present boundaries, the Mental Health Institute maintains a constantly expanding research program.

This program, diversified in scope, is still limited in extent—largely due to inadequate facilities at Bethesda—a restriction which will be eased by the opening of the Clinical Center in 1953.

The Institute has already initiated a series of experimental neurophysiological studies on the convulsive disorders. One such study has indicated that impairment of the outer membrane of the brain is a factor of importance among possible causes of convulsive disorders such as epilepsy.

By maintaining cooperative projects with other institutions, the Mental Health Institute has been able to enlarge its research. At Worcester Foundation for Experimental Biology, for example, mental health scientists are attempting to track down important physiological clues to the cause of schizophrenia—with particular emphasis on the interrelationship between hormonal imbalance and mental illness. At the Public Health Service's hospital at Lexington, Ky., Mental Health Institute scientists have had an opportunity to treat and observe clinical subjects—drug addicts, serving sentences for violating the Federal Narcotics Act, who have volunteered for investigations of drug and barbiturate addiction.

At Lexington, Mental Health scientists have made some of their most noteworthy research contributions. They helped prove that the synthetic drug, methadone, is a satisfactory substitute for morphine in the relief of pain and showed that acetylmethadol, another synthetic, can minimize the discomfort and dangers of morphine withdrawal from addicts. This group has also demonstrated that barbiturates are truly addicting, with abrupt withdrawal resulting in serious physical reactions, including convulsions, and temporary psychoses.

National Heart Institute

Heart disease is a generic term which embraces more than 20 types of cardiovascular illness; however, only 3 major forms—rheumatic heart disease, hypertensive heart disease, and arteriosclerotic heart disease—are responsible for 90 percent of all cardiovascular deaths. It is chiefly on these 3 diseases, which affect almost 10 million people in the United States alone, that the National Heart Institute concentrates its efforts.

The Heart Institute's own research program is centered at Bethesda, but because so little laboratory space has been available since the heart research program was initiated at the National Institutes of Health in 1949, some studies at present are conducted at other institutions.

The section on Gerontology, for example, which is studying psychological and physiological factors in the aging process, is located at the Baltimore City Hospitals. And in the same city, but at the United States Public Health Service Hospital, is the Heart Institute's Clinic of General Medicine and Experimental Therapeutics. There are also small groups of Heart Institute scientists working on other cooperative projects with several universities throughout the country.

Though the program is dispersed geographically, provision has been made for close integration of clinical and basic research which will eventually be the standard for all programs with the completion of the Clinical Center in 1953. How valuable this integration can be is well illustrated by the development of the new drug, procaine amide, which has proved successful in stopping irregular, severe, out-of-rhythm heart beat which is a sometimes-fatal development in many heart attacks. Synthesized by the basic research section on Chemical Pharmacology in cooperation with other scientists, procaine amide was tested clinically by the Institute's Clinic of General Medicine and Experimental Therapeutics in Baltimore and at other institutions. It proved to be of value not only against heart arrhythmias, but also showed promise for use as routine therapy for myocardial infarction—critical injury of the heart tissue caused by a blood clot blocking vital circulation in the heart muscle itself.

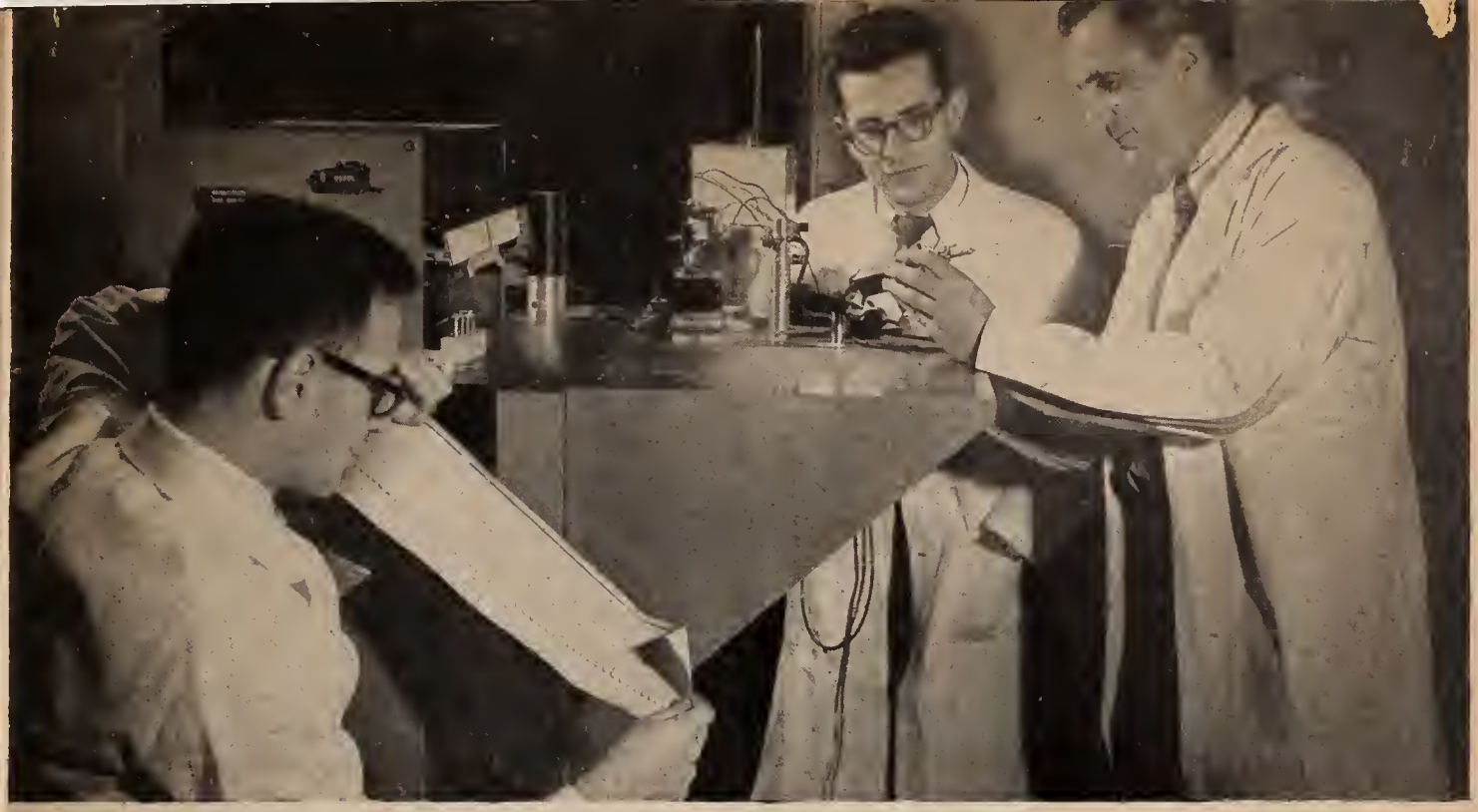
In the same way, other achievements by Heart Institute scientists have been facilitated by the interchange of information between cooperating basic and clinical research laboratories. Typical of these are the establishment of criteria for better clot-preventing drugs and the development of the electrokymograph as a research tool with potentialities as an aid for making early diagnosis of various heart conditions.

In another way, the Heart Institute has not only made good research use of the fundamental interdependence of basic and clinical research, but also of the interdependence of research in the various diseases. For example, the Heart Institute's Clinic of Gerontology is working in close cooperation with psychiatrists

Electron multiplier phototube of electrokymograph—new aid for early diagnosis of various heart conditions.

of the Mental Health Institute in order to establish the relationship between physical and psychological deterioration. Similarly, scientists working on rheumatic fever are intimately concerned with not only cardiovascular aspects of this disease but psychological and microbiological factors as well.

In the Heart Institute's project at Framingham, Mass., all causative factors which might produce heart disease are being investigated. Designed to measure both constitutional and conditioning elements which



Preparing Statham gauge for automatic blood pressure recording.

possibly precede cardiovascular disturbances, this study will involve several thousand persons over a long period of years.

The same broad application applies to many other investigations the Heart Institute is making, such as studies on general metabolism, kidney, and electrolyte metabolism, the autonomic nervous system, and cellular physiology. These studies will provide investigators in other fields the same kind of invaluable clues for their work as they will for heart research.

Testing skin resistance and volume changes of blood content, a National Heart Institute gerontology study.

National Institute of Neurological Diseases and Blindness

Only in recent years has the general public become aware of the importance of a number of serious neurological diseases, such as multiple sclerosis, cerebral palsy, and epilepsy. Along with blindness, it is estimated that these disabling conditions affect more than two million people in the United States.

Investigations on various problems relating to neurological diseases and blindness have been conducted for some time by several of the Institutes, both directly and through research grants to scientists in other places. Authorization by the Congress in 1950 of a National Institute of Neurological Diseases and Blindness permits these investigations to be broadened and intensified.

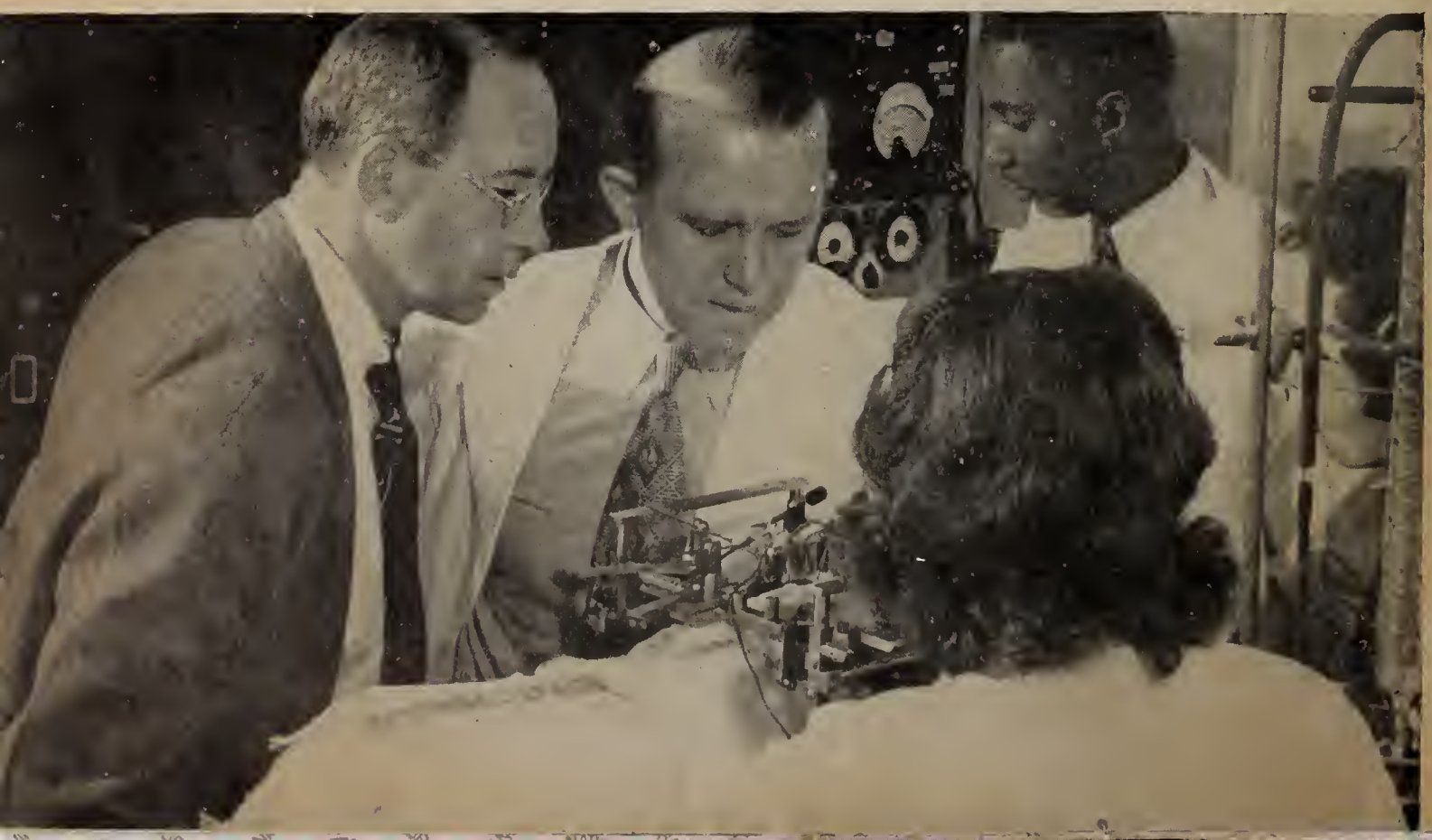
Because the research program of this Institute will closely parallel the basic research program of the National Institute of Mental Health, especially with their mutual interest in the problems of neurology, a single scientific director will guide a coordinated laboratory program for both Institutes.

Planning for a research program in the Bethesda laboratories and Clinical Center was begun as soon as the Institute was established. Some grants previously supported by the National Institute of Mental Health were assumed by the new Institute, and through the Advisory Council of the Neurological Diseases and Blindness Institute, new grants were awarded.

Typical of the studies given aid are: an investigation of the physiology and therapy of convulsive disorders; a study on the growth and regeneration of nerves; an analysis of some regulative mechanisms in neural integration; a clinical and pathological study of the neurological disturbances associated with severe liver diseases; and a study of the nutrition and metabolism of the avascular structures of the eye.

When the National Institute of Neurological Diseases and Blindness is in full operation, an enlarged basic research program will also be conducted in its own laboratories. The Clinical Center facilities will provide additional impetus to the study of neurological diseases such as epilepsy, poliomyelitis, multiple sclerosis, and cerebral palsy, as well as diseases which cause blindness, such as glaucoma and cataract.

Convulsion-type electrical waves recorded from rabbit brain, demonstrating possible mechanism of epilepsy.



Clinical Center

Inadequacy of scientific communication has frequently impeded medical progress. Even when clinical evaluations rapidly follow significant laboratory findings, initial results may not be conclusive, and more time is lost before contributions of perhaps several investigators in different institutions confirm or invalidate the original findings.

The means of helping to bridge this gap and also of further coordinating the attack on heart, mental, neurological, dental, and metabolic diseases, cancer, and certain infectious and tropical diseases is now nearing realization at the National Institutes of Health. The Public Health Service's 500-bed Clinical Center, to be completed late in 1952, is designed to provide opportunities for a unified approach to clinical and basic research.

The Clinical Center is distinctive as a research institution in that it provides twice as much laboratory space as bed space. The concept of clinical research coordinated with basic investigation is carried out by the specific allocations of both bed and laboratory space to the study of specific diseases and by the proximity and close working relationship of these areas on each floor of the Clinical Center.

Both for the patient who has entered the Clinical Center and for the professional people who care for him, the right of the patient to receive the best possible treatment and to be cured if possible is of primary importance. There is, however, one major condition for a patient's admission to the Clinical Center: only those patients will be admitted who meet the diagnostic requirements of a particular disease condition under study at a given time in one of the several Institutes. A cancer patient, for example, will be one of a group of cancer patients admitted on the basis of a common diagnosis which meets specific criteria such as sex, age, the type of cancer, and duration prior to diagnosis. These criteria are necessary in order to eliminate the variables which otherwise might obscure the investigative approach or invalidate its results. Patients will be referred mostly through the cooperation of hospitals and private physicians, both in the local area and from all over the country.

After a patient has been admitted to the Clinical

Sketch of the Clinical Center.

Center, the resources, the equipment, and personnel of the most modern of hospitals will be at his disposal. Available to him, according to his needs, will be medical, psychiatric, and surgical care; nursing, nutritional, and social services; rehabilitation, spiritual ministry, and recreational therapy.

Every effort will be made to keep each patient's own physician informed of progress and results of treatment. Special cooperative relationships will be developed with hospitals and health agencies for the referral of patients suitable for study and for their care after discharge. The resources of the patient's home community will, of course, be utilized for convalescent or nursing home care and for necessary services to his family.

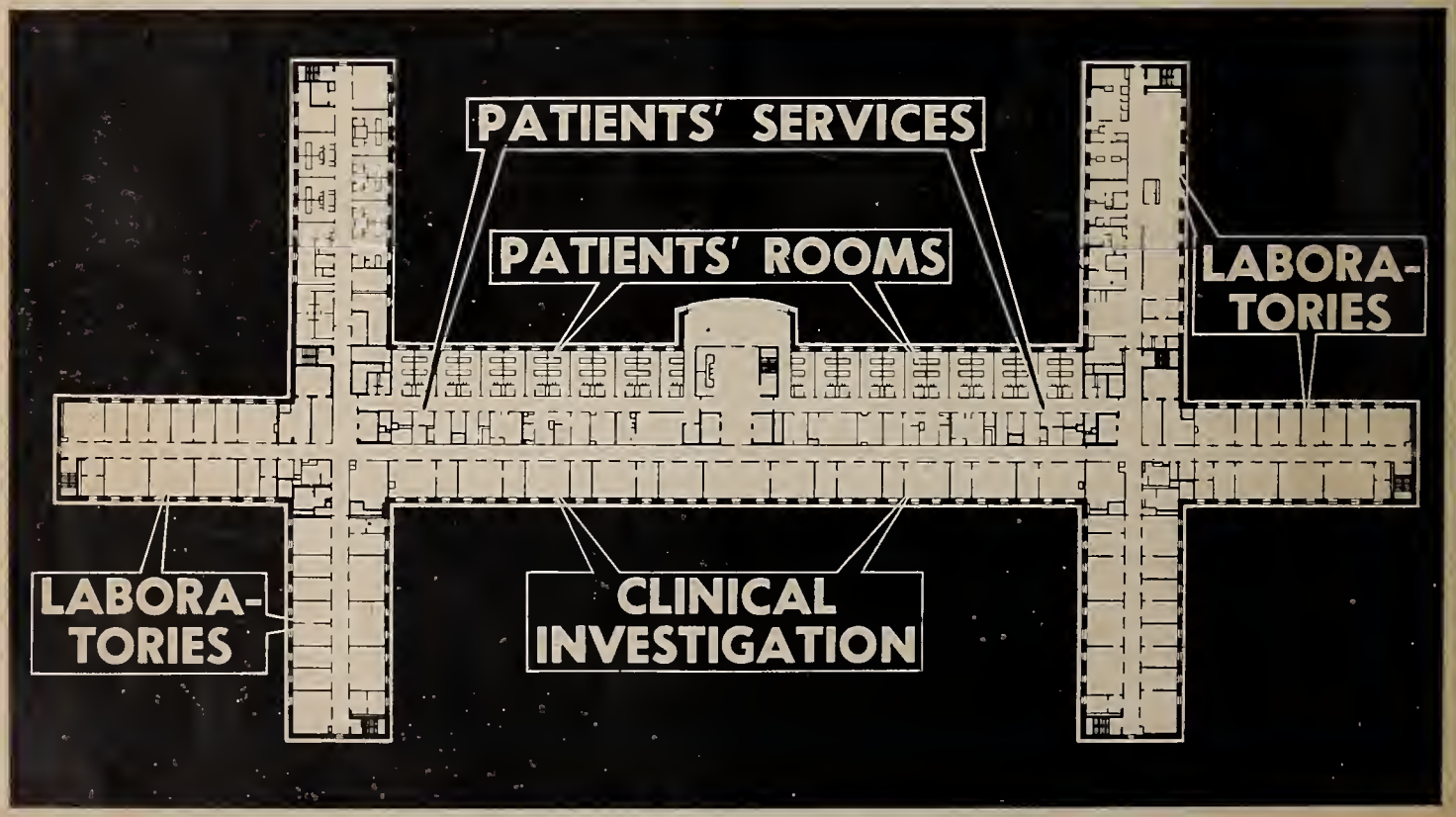
Working together at the Clinical Center to improve existing methods of diagnosis and treatment and to determine the causes of the diseases under study will be both clinician and laboratory investigator—the clinician availing himself of the latest findings tested and approved in the laboratory, the laboratory workers following down the clues obtained by the clinician.

This close relationship not only represents a linking of basic with clinical research, but more informally provides that stimulus which occurs when different points of view are focused on a common interest. This reciprocity—whether it occurs in the laboratory, the lecture hall, or at the luncheon table—will exist not only between laboratory and clinical researchers and those responsible for patient care, but among the various basic sciences as well.

While the Clinical Center will function as a unit, the planning and operation of research will be the responsibility of each Institute which has been allocated bed and laboratory space. Such planning need not be restricted, since the Clinical Center has been designed with both structural and organizational flexibility to meet the changes that are constantly taking place in medical and hospital practice and scientific research. Once the planning for a project has been made, the research team is formed, the problems are coordinated, and arrangement for incoming patients is begun.

To make these special research resources available to scientists everywhere and to further aid scientific communication, the Clinical Center plans to maintain a visiting scientist program. On appropriate occasions the National Institutes of Health will invite outstanding scientists not connected with the Federal Government to make use of the resources of the Clinical Center for the pursuit of their own special studies which promise to be of importance to medical research.

Typical floor plan of the Clinical Center.



Division of Research Grants

In addition to research in its own laboratories, the Public Health Service conducts a far-reaching program of aid to medical and biological research in universities, medical schools, and other nongovernmental institutions. The purposes of the program are to help continue research projects already initiated, to encourage investigators to undertake research in special areas, and to stimulate increased research in small colleges where programs have been limited.

In its administration of the grants program, the National Institutes of Health is guided by seven National Advisory Councils,[1] each of which includes twelve outstanding non-Federal scientists, physicians, and leaders in public affairs. In addition to its responsibility for advising the Surgeon General on Public Health Service activities within its purview, each Council reviews all applications for grants in its special research field and makes its recommendations to the Surgeon General of the Public Health Service for final approval. The Councils, whose members represent a broad area of scientific and public interest, serve as a connecting link between the research programs of Government and private institutions, that they may better serve the research needs of the Nation.

The scope of the grants program is indicated by the fact that in 1950 alone, almost 14 million dollars were

[1] National Advisory Cancer Council, National Advisory Mental Health Council, National Advisory Heart Council, National Advisory Dental Research Council, National Advisory Arthritis and Metabolic Diseases Council, National Advisory Neurological Diseases and Blindness Council, and National Advisory Health Council (this Council is responsible for reviewing grant applications in research areas not covered by other Advisory Councils).

Non-Federal scientists, public leaders, and various Government representatives, together comprising an Advisory Council, discuss and review grant applications.

granted to non-Federal investigators in almost every State. These funds included support of approximately 25 percent of all research conducted in the medical schools of the Nation.

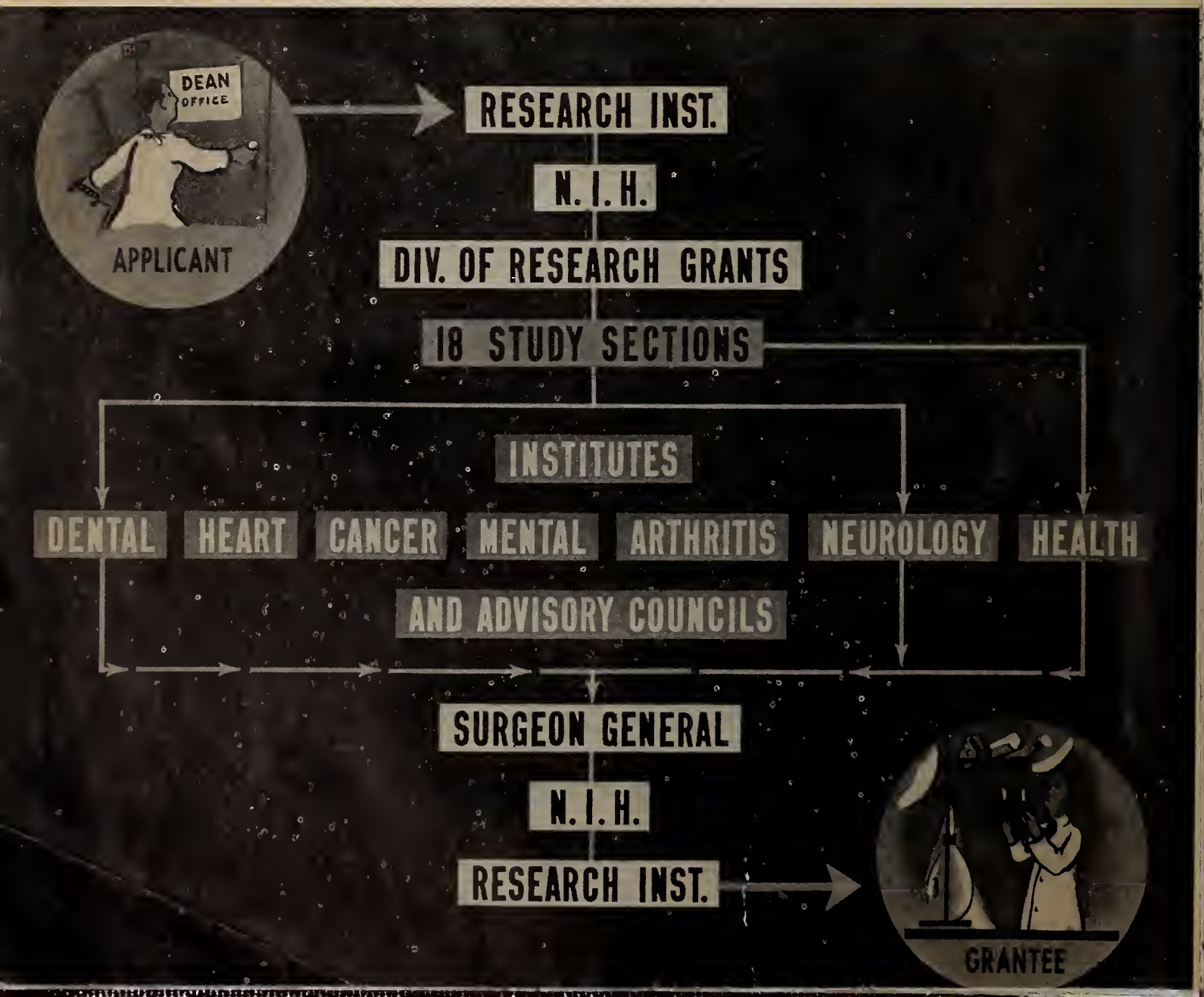
A large number of important scientific discoveries have been made under the grants program. In the year 1950, for example, some of the promising clinical contributions made by investigators supported wholly or partially by Public Health Service grants included: the development of a method for storing red blood cells for several months longer than has hitherto been possible; a more effective treatment for tuberculosis in children; superior antimalarial drugs and of a treatment drug for peptic ulcer (banthine); a photofluorographic camera for the diagnosis of gastric cancer; the further development of means for making blood vessel grafts, articular replacements, and corneal grafts.

In judging which projects warrant support, the Public Health Service and the Advisory Councils are aided by 17 consultant groups known as "study sections" and by the various Institutes. The study sections [2] are each composed of several experts in a specialized field, drawn from leading research institutions all across the country. These specialists review all applications in their field; recommend them for approval, modification, further study, or disapproval; and also survey the status of research in order to determine areas where special investigations might be initiated or developed.

Scientific freedom is a guiding principle in this program. Once a grant has been made, the investigator is subject to neither interference nor direction. At any

[2] Biochemistry and Nutrition, Cardiovascular, Dental, Environmental Health, Experimental Therapeutics, Hematology, Mental Health, Microbiology and Immunology, Metabolism and Endocrinology, Morphology and Genetics, Pathology, Pharmacology, Physiology, Public Health, Surgery, Tropical Medicine, Virus and Rickettsial.

Steps by which a grant application is processed.



point he is free to turn off the main road in order to track down the promising but unexpected lead which so often points the way to important scientific discovery.

Most research grant applications are initiated by individual scientists for projects which range across practically every important disease and every type of scientific problem encountered in medical research. In addition, as national needs arise, the Public Health Service may stimulate and encourage large-scale programs of research grants in specific areas. For example, with a special Congressional allocation of $2,300,000 in 1950, the Public Health Service supported a variety of investigations on ACTH and cortisone to obtain as rapidly as possible more precise knowledge of the value of these compounds in the treatment of many different diseases, to determine proper dosage schedules, to discover how to synthesize them, or otherwise increase their availability. Many projects under this special program were devoted to understanding the total function of the pituitary and the adrenal cortex because of the new clues they hold to the study of health and disease.

The Division of Research Grants of the National Institutes of Health acts as the coordinating agency for the whole research grants program and administers specifically those grants that do not fall within the purview of a particular Institute. It is also responsible for administering the Public Health Service's fellowship program, under which, in 1950, more than $1,500,000 was spent to assist 470 of the most promising candidates through PHS Fellowship Awards. This program, allocating $1,600 yearly to a masters'-level fellowship, $3,000 to postdoctorates, and higher stipends for special fellows, is a double guarantee that the most promising students in scientific research will be able to continue their development and that the nation will have available a continuing supply of medical research manpower in both war and peace.

Applicants for fellowships are carefully screened by two special Public Health Service boards; a Central Qualifications Board, which makes preliminary recommendations, and a Special Fellowships Board for each Institute. Applicants are judged on the basis of already demonstrated ability, including class status and laboratory work.

The Nation-wide program of the National Institutes of Health in support of medical research is broader than research grants and fellowships alone. Several of the Institutes are also authorized by the Congress of the United States to award grants and provide technical assistance for the initiation and improvement of teaching programs, for training of specialized medical and scientific personnel, and for construction of research facilities.

Geographical distribution in 1951 of research grants and fellowships of the National Institutes of Health.

Directory to the Institutes

	Building
ADMINISTRATION	1
NATIONAL MICROBIOLOGICAL INSTITUTE:	
Administration	5
Laboratory of Infectious Diseases	5
Bacterial and Mycotic Diseases	5 and 7
Basic Studies	5 and 7
Epidemiology	5
Experimental Therapeutics	6
Virus and Rickettsial Diseases	7
Laboratory of Tropical Diseases	5
Chemotherapy of Protozoal Diseases	3
Helminthic Diseases	5
Medical Entomology	5
Protozoal Diseases	5
Therapeutics and Preventive Measures	5
Special Studies on Physiology and Clinical Immunology	5
Laboratory of Biologics Control	5
Bacterial Toxins and Vaccines	5
Blood and Blood Derivatives	5
Control Tests	5
Virus Vaccines and Basic Studies	5
Serum and Infectious Hepatitis	5
Rocky Mountain Laboratory (Hamilton, Mont.)	
NATIONAL INSTITUTE OF ARTHRITIS AND METABOLIC DISEASES:	
Administration	4
Laboratory of Biochemistry and Nutrition	4
Biochemistry and Physiology of Nutrition	4
Enzymes and Metabolism	3
Endocrinology	3
Fractionation and Isolation	3
Laboratory of Chemistry	4
Carbohydrates	4
Analgesics	2
Steroids	4
Laboratory of Pathology and Pharmacology	T–6
Pathologic Anatomy	T–6
Comparative Pathology and Hematology	4
Metabolic and Degenerative Diseases	4
Pharmacology and Toxicology	4
NATIONAL CANCER INSTITUTE:	
Administration	T–6
Cancer Control Branch	T–6
Cancer Research Grants Branch	T–6
Cancer Research Branch	
Biology	6
Biochemistry	6
Biophysics	6
Endocrinology	6
Epidemiology	T–6
Chemotherapy	8
Pathology	8
NATIONAL INSTITUTE OF DENTAL RESEARCH:	
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Functional Morphology	4
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NATIONAL INSTITUTE OF MENTAL HEALTH:	
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Training and Standards Branch	T–6
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Administration	T–6
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Chemical Pharmacology	3
Chemistry of Natural Products	3
Kidney and Electrolyte Metabolism	3
Technical Development	3
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CLINICAL CENTER	10
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RESEARCH GRANTS DIVISION:	
Operations Branch	T–6
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ANIMAL HOUSE	T–10
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UTILITIES BUILDING	12

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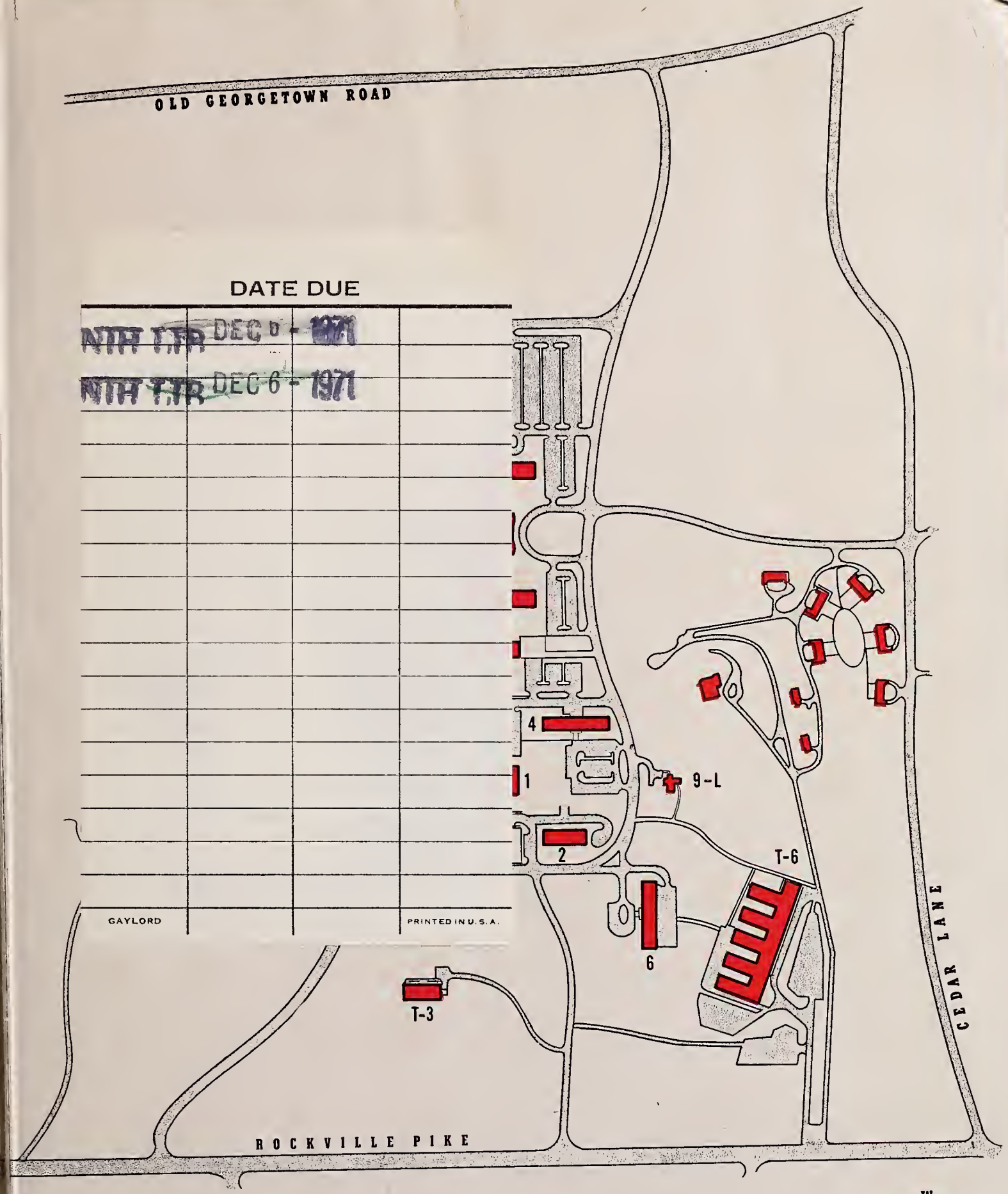

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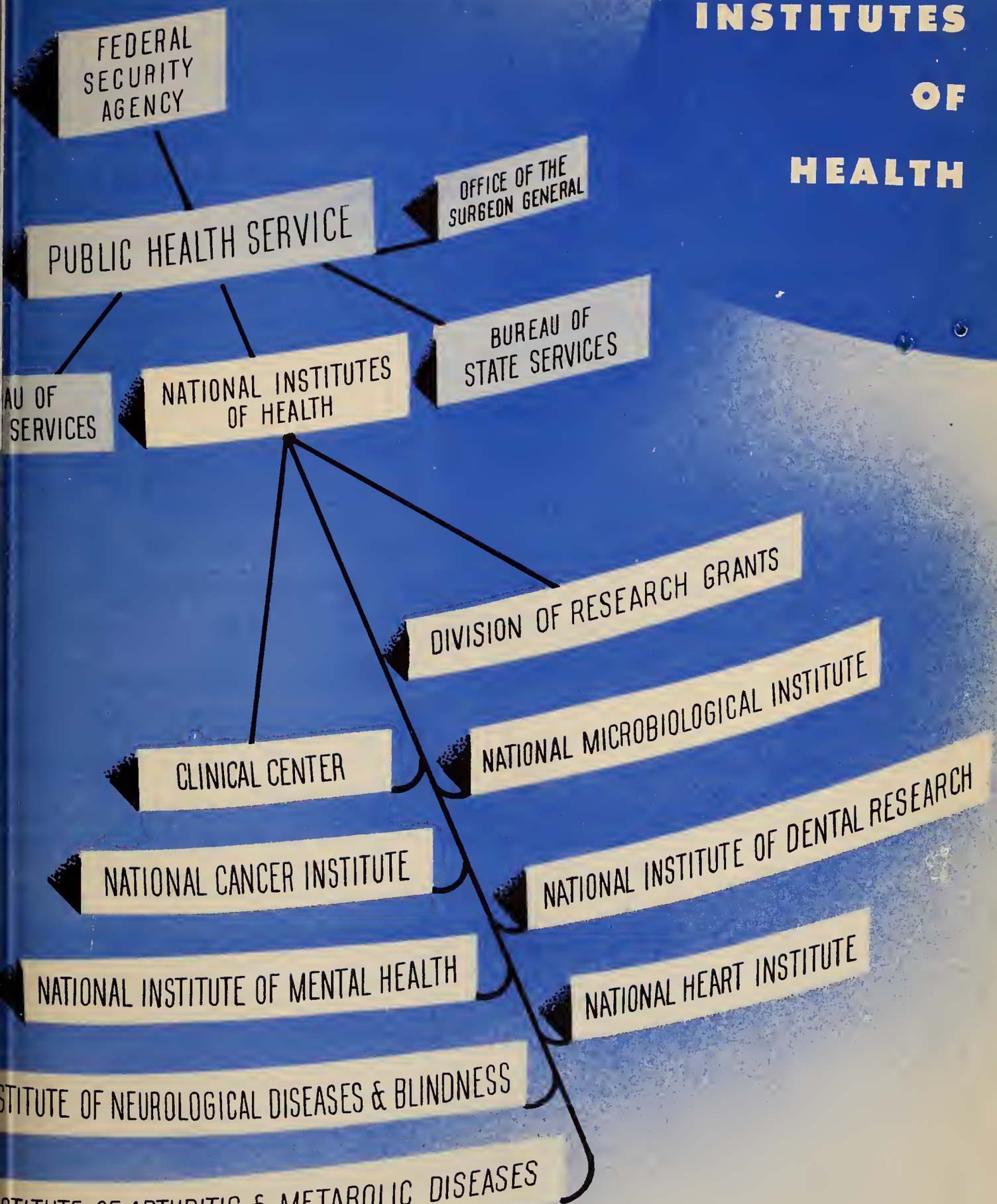

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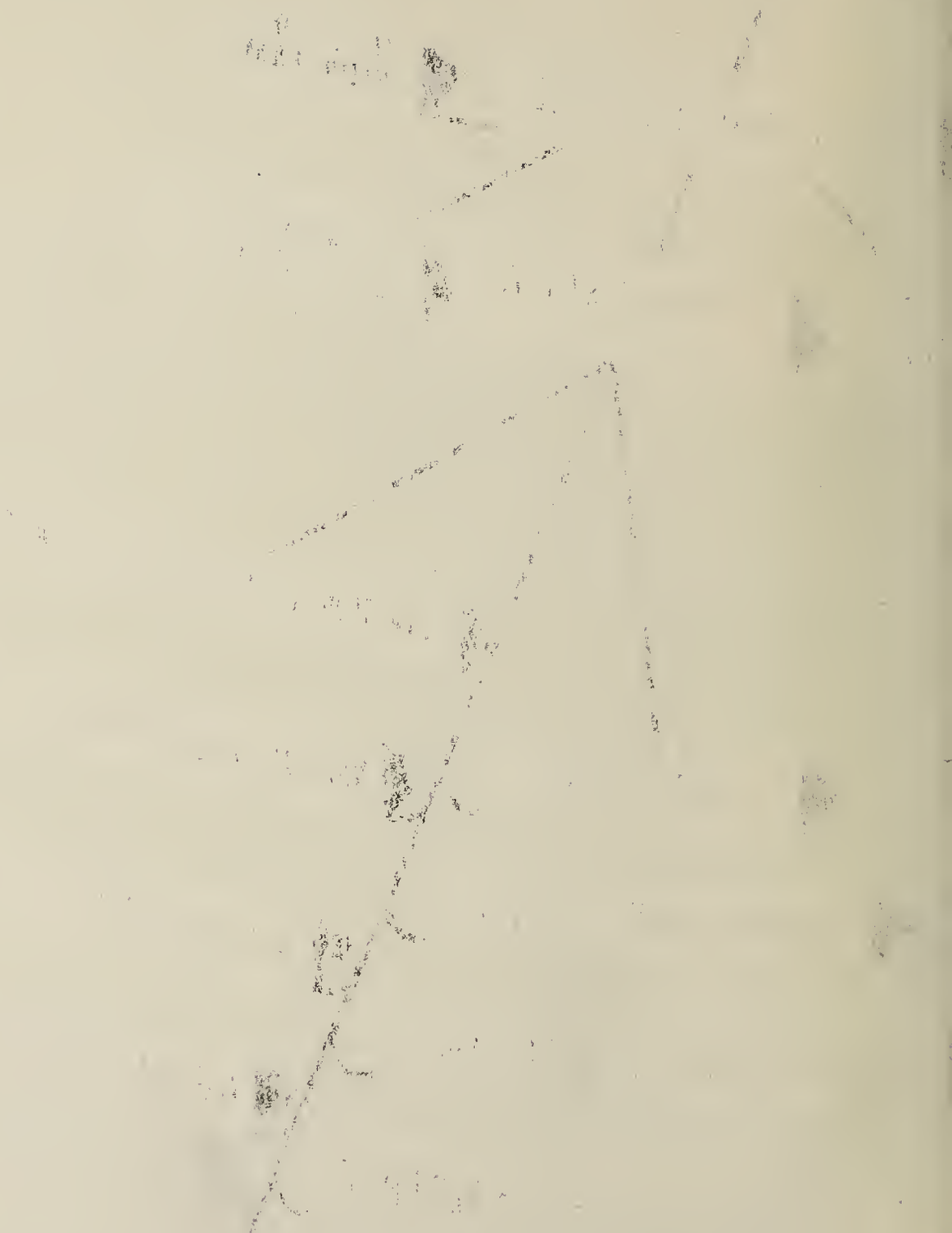

THE NATIONAL INSTITUTES OF HEALTH

THE NATIONAL INSTITUTES OF HEALTH, principal basic research arm of the Public Health Service, had its beginning in a small room at the Marine Hospital on Staten Island. A laboratory with apparatus modeled after that used by Koch was set up in the hospital in 1887, when bacteriology was a new science. Here Dr. Joseph J. Kinyoun demonstrated the organism of cholera, which had been brought to the port of New York by passengers arriving on steamships from abroad. Shortly thereafter, Dr. Kinyoun was sent to study under Koch in Berlin and at the Pasteur Institute in Paris. Upon his return to the United States, he continued to serve as chief of the laboratory for 12 years.

After only four years, better facilities were provided for the new unit at Marine Hospital Service headquarters on Capitol Hill in Washington, where the top floor of the building was given over to the officially recognized Hygienic Labbratory.

These quarters too were soon outgrown, and in 1901 Congress provided land and funds to erect "a laboratory for the investigation of infectious and contagious diseases, and matters pertaining to the public health." The new location, overlooking the Potomac River not far from the Lincoln Memorial, remained the home of the Hygienic Laboratory for nearly 40 years.

In the 1894 report of the Hygienic Laboratory is this note: "It is proposed to detail from time to time officers of the Service to assist in laboratory work and for their further instruction in bacteriological diagnosis of contagious diseases and scientific investigation of their causes and means of prevention." Thus the work of the Laboratory first developed as a part of the legal duties of the Service. Investigations of epidemic diseases such as cholera, plague, and yellow fever were carried out under the leadership of the Laboratory staff, and many perplexing problems were solved. Before long, questions encountered in all fields of the Public Health Service were being referred to the Laboratory as its only organized group with training in scientific investigation. Studies were extended to include not only laboratory research in the strictest sense, but also related subjects and field investigations of all diseases that affect the health of the nation.

In 1930, the name of the Hygienic Laboratory was changed to the National Institute of Health.

Over the course of years, it became evident that demands upon the Service were such that provision would have to be made for ever-expanding research facilities. The one-room laboratory gave way to the several rooms of the Marine Hospital headquarters and later to the separate buildings on specially designated land. In this last location, the establishment grew from one to four buildings, but finally these too became inadequate.

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In 1935, the Secretary of the Treasury accepted for the Public Health Service a beautiful tract of some 90 acres of land northwest of Washington and beyond Bethesda, in the adjoining Maryland countryside. This estate, donated by Mr. and Mrs. Luke I. Wilson, was to become the permanent home of the National Institutes of Health. Emergency funds allocated by the President were used to construct six red-brick buildings of Georgian design housing administration headquarters, offices, and the laboratories. One building was especially planned for the National Cancer Institute, created by an act of Congress in 1937. These made up the original establishment on the present site of the National Institutes of Health.

In June, 1948, the name was changed to the National Institutes of Health.

Two new Institutes were established in November 1950. There are now seven Institutes: the National Cancer Institute, National Heart Institute, National Institute of Dental Research, National Microbiological Institute, National Institute of Mental Health, National Institute of Neurological Diseases and Blindness and National Institute of Arthritis and Metabolic Diseases.

In addition to research conducted in its own laboratories, since 1946 the Institutes have conducted a research grants and fellowships program through which financial assistance is provided for the investigative work of qualified non-Federal institutions and individual scientists. These programs, which now involve grants totalling around $10,000,000 yearly, operate with the advice and guidance of some 300 of the nation's top scientists, physicians and leaders in public affairs organized in National Advisory Councils and Study Sections.

The work done by the Institutes will extend into the clinical field with the completion in 1952 of the Clinical Center, a combined clinical and laboratory facility. Here the complex and varied disciplines of modern medical science will be brought together for an integrated study of disease and disability. The Center will provide bed space for 500 patients who have diseases under investigation in the Institutes...and twice as much space for basic scientific investigations.

In a little over sixty years, the scientists of the old Hygienic Laboratory and of the modern National Institutes of Health have made a number of major contributions to man's fund of scientific knowledge. Research milestones at NIH include such accomplishments as these: pioneer work on anaphylaxis by Rosenau and Anderson in 1906; the recognition by Goldberger in 1914 that pellagra is a dietary deficiency disease; Francis' identification in 1919 of what was locally called "deer fly fever" (in Utah) as B. tularense infection conveyed to humans from diseased jack rabbits by the deer fly; Spencer's development of a vaccine for Rocky Mountain spotted fever in 1924; the discovery of many new diseases of man, such as lymphocytic choriomeningitis, rickettsialpox, and Louisiana pneumonitis; the discovery that fluorinated water prevents tooth decay; and the recent work indicating that saline solution taken by mouth is effective in the treatment of shock resulting from severe burns and other injury.

N A T I O N A L M I C R O B I O L O G I C A L I N S T I T U T E

THE MICRO-ORGANISMS WHICH PRODUCE DISEASE in man are the National Microbiological Institute's area of research. This Institute is the modern counterpart of Dr. Kinyoun's one-room bacteriological laboratory. Between his microscopic studies of the cholera organism and the Institute's present work in more than eighty major fields lies a half-century of progress in the control of communicable diseases. NIH scientists working on infectious and tropical diseases have played important roles in the substantial advances recorded against these diseases.

Organizationally, this Institute is composed of the Laboratories of Infectious Diseases, Tropical Diseases, Biologics Control, and the Rocky Mountain Laboratory at Hamilton, Montana, which concentrates on animal diseases which are transmissible to man.

As long as there is a single case of a serious communicable disease in existence, there is always possibility of an epidemic. The National Microbiological Institute maintains constant scientific vigilance against such an eventuality.

The Laboratory of Infectious Diseases is doing important work on diseases which still stubbornly refuse to come under control, such as poliomyelitis, influenza, the common cold, encephalitis, and virus pneumonia.

As a result of World War II and world-wide travel of our times, tropical diseases became more important to Americans than ever before. The scientists of the Laboratory of Tropical Diseases hold a position of leadership in work on malaria, amoebic dysentery, schistosomiasis, and other tropical diseases.

The Biologics Control Laboratory is the guardian of the American public in the use of biologic products. The Laboratory supervises the observance of the standards it sets for all serums, vaccines, blood products, and other biologics sold in interstate and foreign commerce. Working constantly with commercial manufacturers and the World Health Organization, it seeks also to improve the effectiveness of existing products.

N A T I O N A L C A N C E R I N S T I T U T E

THE NATIONAL CANCER INSTITUTE was established in 1937 to achieve two major goals: to increase our basic knowledge of cancer, and to prevent cancer deaths by disseminating over wider areas knowledge already developed.

The Institute's research on cancer is intensive and extensive. In its own laboratories, scientists seek basic knowledge on all life processes as they relate to abnormal growth. The study is broken down into research sections on biology, endocrinology, chemotherapy, biophysics, pathology, biochemistry, and cell physiology.

Clinical research meanwhile is carried on at the Laboratory of Experimental Oncology at the University of California; at the Baltimore Marine Hospital; and at the Cancerigenic Research Laboratory at Georgetown Medical School.

The research grants program under the guidance of the National Advisory Cancer Council supports cancer research on an even larger scale than that within the Institute's own laboratories. Grants and fellowships for special work are given to qualified institutions and individuals throughout the United States.

The Institute carries on its cancer control program through financial aid to states and institutions and through consultant services and demonstrations. Its educational projects, both public and professional, are numerous, including publication of a periodical for the general practitioner and training courses for physicians, nurses, and public health workers.

N A T I O N A L H E A R T I N S T I T U T E

RECOGNIZING THAT DISEASES OF THE HEART AND CIRCULATION are the chief causes of death and disability in the United States, the Congress established the National Heart Institute in 1948 to conduct a research and training program on a wide scale.

The Institute makes a three-pronged attack: through research in its own laboratories, through grants to outside individuals and institutions, and through research fellowships and traineeships. The National Advisory Heart Council makes recommendations on grants for extramural research and for personnel training.

Control programs for cardiovascular diseases by state and local agencies are aided by the Institute working through the Bureau of State Services of the Public Health Service.

Until it is able to move into its own laboratories at the Clinical Center, the bulk of the Heart Institute's work is being carried on cooperatively with other institutions. Eleven joint research projects are under way in four medical centers. They include evaluation of the electrokymograph and other new diagnostic tools; investigations of the cardiovascular diseases of the aged; and an epidemiological study on the prevalence of heart disease in the adult population of a single community.

N A T I O N A L I N S T I T U T E O F D E N T A L R E S E A R C H

ESTABLISHED IN 1948, THE NATIONAL INSTITUTE OF DENTAL RESEARCH seeks new and better ways to prevent and treat dental caries, pyorrhea, and other

dental diseases. In its own laboratories, scientists study tooth structure and the factors which affect it - from biochemical, biophysical, and bacteriological standpoints.

Important epidemiological studies have been carried on since the early 1930's (when the laboratory was a part of the old Infectious Diseases Division) which have produced almost all of the basic knowledge on the effect upon dental caries of fluoride in drinking water.

Two other important phases of Institute operations are the stimulation of research in the nation's forty dental schools and in other institutions; and the provision for traineeships and fellowships for competent workers interested in research.

NATIONAL INSTITUTE OF MENTAL HEALTH

THE NATIONAL INSTITUTE OF MENTAL HEALTH, established in 1949, is the chief government agency concerned with improving mental health in the United States.

It operates a three-sided program: research, training of mental health personnel, and assistance to states in their development of community mental health services. The National Advisory Mental Health Council and its Research Study Section pass on fund allotments.

To increase the nation's supply of research personnel, mental health research fellowships are offered to graduate students in the basic and social sciences, as well as in the psychiatric and mental health professions. In addition, medical schools receive grants to improve and extend their undergraduate psychiatric training program.

The states and territories are using Public Health Service grants-in-aid to strengthen state and local mental health services. More than 100 new clinics have been established, and 200 old ones expanded their services.

Research grants have made possible a wide range of studies in psychiatry, neurology, biochemistry, psychology, and sociology. Particularly significant studies are carried on concerning chronic intoxication with barbiturates, epilepsy and other convulsive disorders, and multiple sclerosis. An expanded intramural research program is planned to begin with the opening of the Clinical Center.

NATIONAL INSTITUTE OF ARTHRITIS AND METABOLIC DISEASES

ESTABLISHED NOVEMBER 1950, THIS INSTITUTE acquired the functions of the Experimental Biology and Medicine Institute which is officially abolished.

The Institute is engaged in basic research in fundamental physiological and biochemical processes. Work is divided into four study areas: biochemistry and nutrition; pathology and pharmacology; chemistry and chemotherapy; and physical biology.

National Institute of Arthritis and Metabolic Diseases scientists have recently uncovered new information leading to an understanding of how the blood is formed. The process of muscle contraction, observed under the electron microscope, has produced for the first time a basic explanation for the motion of all living muscular tissues.

Normal phenomena such as the breakdown of foods within the human system and the chemical structure of carbohydrates are under constant study, as is the problem of allergic reaction.

The Institute uses radioactive materials to study such processes as the way the body produces immunity against infection; it is also experimenting with irradiated animals to find better ways of protecting human beings against radiation harm.

Besides absorbing the personnel and functions of the Experimental Biology and Medicine Institute, the new Institute is authorized to undertake additional research projects in arthritis and other metabolic diseases, and to conduct a grant and fellowship program with the aid of the newly created National Advisory Arthritis and Metabolic Diseases Council.

NATIONAL INSTITUTE OF NEUROLOGICAL DISEASES AND BLINDNESS

THE NATIONAL INSTITUTE OF NEUROLOGICAL DISEASES AND BLINDNESS, authorized by Public Law 692, was officially established November 22, 1950 as part of the National Institutes of Health. It is to foster research on neurological diseases (including epilepsy, cerebral palsy, and multiple sclerosis) and blindness.

The Institute will conduct research in its own laboratories on diseases specified in the Act and will support related research in non-Federal institutions. The Surgeon General has appointed a National Advisory Council to consult with him, and make recommendations with respect to the activities of the Institute.

Grants to universities and other non-profit institutions will provide funds for research relating to the specified diseases. The Institute will support professional training through clinical traineeships and research fellowships, and grants for construction are also authorized by the Act.

D I V I S I O N R E S E A R C H G R A N T S

THE DIVISION OF RESEARCH GRANTS administers the Public Health Service program in support of research in medical and allied fields for which institutional funds are not adequate or which could not otherwise be conducted. The major objectives are (1) to expand research activities in universities and other institutions, (2) to stimulate the initiation of research in small colleges where previous research programs have been limited or nonexistent, (3) to encourage investigators to undertake research in neglected areas, and (4) to provide training for scientific personnel. In carrying out these objectives, the aim of the Public Health Service is to promote the highest quality of endeavors in both fundamental and applied research, without restrictive regulations. There is no direction, control, supervision, regimentation or interference in the conduct of the research. Accordingly, investigators are free to follow whatever leads their research discloses.

Authority for research grants is provided by the Congress in the Public Health Service Act of 1944 (Public Law 410, as amended.)

The Surgeon General may make grants in aid to universities, hospitals, laboratories, and other public or private institutions, and to individuals for research projects approved by the appropriate Advisory Council.

Applications for research grants in support of work in cancer and closely related fields are referred to the National Advisory Cancer Council for recommendation to the Surgeon General; those in mental health and closely related fields, to the National Advisory Mental Health Council; those in dental research and closely related fields to the National Advisory Dental Research Council; those in heart research and closely related fields, to the National Advisory Heart Council; those in arthritis and metabolic diseases, to the National Advisory Arthritis and Metabolic Diseases Council; those in neurological diseases, to the National Advisory Neurological Diseases and Blindness Council; and those in other research fields, to the National Advisory Health Council. Each of the Councils meets three or four times each year as need requires. Council members are appointed by the Surgeon General with the approval of the Federal Security Administrator.

In order that the Advisory Councils may have the benefit of the best scientific advice on applications for research grants, outstanding authorities in each of the major fields of medical research have been appointed as members of Special Study Sections. Appointments are made to provide for rotation of membership. The majority of these special counsultants are non-governmental scientists selected by the Surgeon General on a nation-wide basis. These Study Sections have accepted the responsibility (1) for reviewing applications for research grants in their respective fields, and forwarding their recommendations for approval, modification, further study, or disapproval to the appropriate National Advisory Councils; and (2) for surveying, as scientific leaders, the status of research in their fields in order to determine areas in which research activities should be initiated or expanded. Study Sections meet prior to the regularly scheduled meetings of the National Advisory Councils.

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